of the invention. Although the invention has been described in connection with specific preferred embodiments, it should be understood that the invention as claimed should not be unduly limited to such specific embodiments. Indeed, various modifications of the described modes for carrying out the invention that are obvious to those skilled in relevant fields are intended to be within the scope of the following claims.

SEQUENCE LISTING

<110> Owyang, Chung

<120> ORPHANIN FQ RECEPTOR NUCLEIC ACIDS

<130> um-06962

<160> 36

<170> PatentIn version 3.0

<210> 1
<211> 23
<212> DNA
<213> Artificial Sequence

<400> 1
gcagcagccg gtgcggcagc cag   23

<210> 2
<211> 21
<212> DNA
<213> Artificial Sequence

<400> 2
tagacaccgt ccactgaggc c   21

<210> 3
<211> 26
<212> DNA
<213> Artificial Sequence

<400> 3
gtttctgtgc cctgttccag gaactg   26

<210> 4
<211> 25
<212> DNA
<213> Artificial Sequence

58

```
<400>  4
cctgccccttt ggactcaagg tcacc                                              25


<210>  5
<211>  24
<212>  DNA
<213>  Artificial Sequence

<400>  5
ggtccacgcc tagtcatgct ggcc                                               24


<210>  6
<211>  25
<212>  DNA
<213>  Artificial Sequence

<400>  6
gctcagtcca ctgtgctcct gcctg                                              25


<210>  7
<211>  26
<212>  DNA
<213>  Artificial Sequence

<400>  7
ggtgctaaaa ggtcttcctc taggac                                             26


<210>  8
<211>  20
<212>  DNA
<213>  Artificial Sequence

<400>  8
cagtgttagc aagaccaggg                                                    20


<210>  9
<211>  8372
<212>  DNA
<213>  Rattus norvegicus

<400>  9
tgtgtgcccg tctgccaatt taagcatgtt accagcattc ccatcgtttc caaatgctga        60

gcccttgaga ctcggagacg cacgtgaaag actactttag ggatatagag actctgtacg       120

aggtgcagga actctctggg ggtttgtgtg ccagcttttg ccgggggtgg catggggatg       180

aaaaaggaag tgatggaagg gcagggagag agagagagag agagagagag agagagagag       240

agagagagag agagagagca acagagagtg catacttatg tgctatatat ctagggggcct      300
```

59

```
ttctctgttc ttgcctgttc ccacactagt tcacatcttg tttgtatctt tctctttgtg    360

cctgaatgca ccttgtgggt tgtatatgtg atccttgtgt gcatctctga gcacatatcc    420

cttgtgtctc tgtatctcta aactgtgcct gtctgggtac ctctttgtat gttctgttta    480

tttgcaggaa tgtgtcctca tgtgtctcct tgagtgtcca tgtgtctccg agaacggaga    540

gacaagtcct tggagacagc ttgggatgct gagtcctggg gtgtctgtct gctctggcct    600

tttctggttg gacaggtatc ctagcaacac ttctgtgagt tgcctagcaa ccaggtcccc    660

atccttagag aaagagcagg gtctggctgt atgtgggagg tctggctctc attcagtcca    720

gacaggaaaa acaaacctat gatttgatga tgactagaga ctcagcatag ggtccctagc    780

ctacatgacc ttaacttatg gttttttttct cagtggactg tgctccccca ccccacccc    840

cccgtgctgg caaagaagga ggtccctagg agcttagtat ctctgtgttt tctaagatct    900

aattctggga tttggctgtg gtgtagcttc aagtgaccag caaacctggc ttccccttat    960

ccctgccatg ttgacaggca gctccagact tcagaggcgt gatgctttca tttgtgtgag    1020

gataatatgg gtggcagtgg ccatgtgtag tgggggttcc tgggttcagt tttgtcttga    1080

gcttagtgca cattaggtat aaacagcaca tagtagactc agggcagtgc tgggtccaca    1140

gtccagacaa tctcttgttt attcgcaaga aggcctttac atggagaatt agttgggtca    1200

ggatattgct atcactgtgg tactctaccc tattggacac cggctgaggg cagttctggg    1260

taggaaagct agcaaaatct ggtctgtgct cagtggtggt agcacatgcc tttaatccta    1320

gcattcagga agcagaggca gatgtgtctc taagttctag acagccaag gctacacaga    1380

caaatcctgt ctctaacctg ttaacttccc caaacaaaac aaaacaaaac agagcaaagc    1440

aaagcaaagc aaaacaaaac aaaacaacat tttcgagtgt tggagcctca cgtctacttc    1500

tgggtgagca tttctctgta tacatcttga atgtgttctt gtgtctaagg ctgtgcgtgt    1560

atgtgtgtct gaattcctgt tcatgtctct attttttgtgt tcatggatgt ccccattgtg    1620

tgtcctaggg cctgagtgtg tttgtgttgg gtgagcccat cacattatat gtttgttaat    1680

cttttggctc ctacttggtg tggagcctag gggttctggt ctggtaatct tccttttttt    1740

ttttttttttt tggctttctt ctccaacctg cacagcccct ccttctctca gccgcagcct    1800

tctgcccctc cccttctgg ctgccgcacc ggctgctgcg tctagtcaat atcttatctt    1860

ccgagcagga gctaggagcc attcccagcc gcagcagacc ccaatctaga gtgagagtca    1920
```

60

```
ttgctcagtc cactgtgctc ctgcctgccc gcctttctgc taagcattgg ggtctatttt  1980

ggcccagctt ctgaagaggc tgtgtgtgcc gttggaggta agaggggctc ctgctgcctc  2040

tgacagagct gggggtgggg gagccctggg aggtagctat gtgaagtgcc tgagccttag  2100

gcatttctgg ataaattcca tgccttttgt gccccagtgt accttaggat ggtttaggca  2150

ttttttgtgt ttggctggct gtgagcccct gggtcttggt gggtggacat gtgtgcttgt  2220

gtagctacgt tgcttctgtg cgggtctata accctaatgt gaggtaacct tgtaggtaaa  2280

tgtgctccca tgcctctgtg tgtgtcacca tgtgcccacg ggcatgtctg cctttgtctg  2340

tgtccgtgtg tctgtgtgtg tgcctagtgt ttgtgcatgc tcatggaggc gttcatgtgc  2400

ctgttagtgt agttgtgctg tgttctaagg cctcagtgga cggtgtctag cactgtggtt  2460

acttgtttct gtgccctgtt ccaggaactg tactgagtgg ctttgcaggg tgacagcatg  2520

gagtccctct ttcctgctcc atactgggag gtcttgtatg gcagccactt tcaagggaac  2580

ctgtccctcc taaatgagac cgtaccccac cacctgctcc tcaatgctag tcacagcgcc  2640

ttcctgcccc ttggactcaa ggtcaccatc gtggggctct acttggctgt gtgcatcggg  2700

gggctcctgg ggaactgcct cgtcatgtat gtcatcctca ggtaggctgg gccccatcag  2760

tctgtgaagg gggaacctga ggcaggaggc tgttctgggt gaatctgaac aagtatggat  2820

tttctgcttg ctccatcaaa tttctttcct ctctgttcaa ggggcatgac cacccttgaa  2880

gttcaactcc tgttctgtcc ccatctgtct cagactaggt ggaggcttgg agctgcagat  2940

aaattcatgc catgatgtct gtgtgaataa cctcatgggt acacaggatc ctaggatttc  3000

tcaaacagag gaagaggggc tggtgctggg cctgaagctc ttattcattg acttttggga  3060

tctctattca tggtggatgt ctttagctga gcccatgctc tattggtgct cagaaatatg  3120

aaaatttgga ggactagaaa gaaaggcagc agtactgggc aactgagtca gagtcaacag  3180

tgaggggata ctggagggag cagtatgagg tgcagttctg tggacacaaa agctggacaa  3240

ggagtatgca attggtaaaa tgtgtcacgg caatgatggt ctctgttttt ttccagctgg  3300

gagggcattg aggggactg gagacagcag gtgaggactt gaatgccaga atggggacat  3360

tgggaagaca tgggaggtcc ttgaatggtg aataactaga gcaaggttct tcactgatat  3420

atttcctctt tcaaaaagat gactctgaag aaagcagtca tggtcccctt gatggtatca  3480

tggtaggtgt ggtggtggtg gagaaagggc agtgcaggtt ctatattctg cctcatcacg  3540

atcctcttag tattcctgag caactgtttt ctccattcgt tagatgggaa atatggatta  3600
```

61

```
cataaccata tataggtgca tgtgcataca cgtgtatata gtataatatt gatatgtgat    3660

tggacagtgt agtaggaaaa gccttccaag tactgacttt cagcagagga tccttgtggg    3720

aaactattct atgatctaag tgttagagga tattcatctt tggcaagaag tgcagcaacc    3780

tgggacagtt tgtgagcctt gccttccctt cttgtcctca gcatttctct cccatattta    3840

ctgcatcagg gcagacaagg agcaccatct tttccagtag catcctcaga gagctagtct    3900

caggaactgc tgtggccaca ctggctctgg aggcaaaaca cggcgtgttt gagttggcat    3960

acgccaggag tcagaaaaac ctgctctgag ccccattttg caccttcgca gttccaagcc    4020

ttataaaagc tacttacgtc ctccgagcct cagcttcctt ctctgcagcc tagggatcta    4080

atagcatttt ttcttttggg gtaaacctca aatgagataa aatctacgtg aagagcttgg    4140

ctcagatatc taccattatc gttgttattg ttgtttattg tagttaaggt ctctaggatt    4200

aatgtctaag aaacagaact taatcccaga ttccctgata gcaactaaac tatcatggac    4260

tactgttacc tctagttcta tcactaccat accaccataa ccactctaac caccaccacc    4320

accaccatca ctataatcac ccttccctac cgctatcata aacattaatt cattccacta    4380

atatttatca cttataatgt ccctagcatg gttcccggtg cttggataca tcaaacctaa    4440

ctagcacatc tcttgttttc tttattagaa ttaaaaaata aattatgttt atttatgtgt    4500

ctgtgtatgt ctgtctggat gtgtaggtca gaggagaaag ttgggtttct ccttttacca    4560

tgtaagtttc tccttctacc acatgcgtcc tggagataga actcaggttg tcagaattgg    4620

tagtaagtgc ccttaccggc tgagccattt ggctggccca gcattgtctg ttttcattgc    4680

tagacaatac tgtgcagttg gaagacacag atctttgatg aactttacag gcagtgccct    4740

gaaaagcctc tgagagaagt cttaagagag actgaggaga gaagacagca tctctctctc    4800

ttgattcatt ccacaaactc acattcaggt tagatatgca ctcaggtact cctccatgcc    4860

cccaactttt ccagggtagt cttgtcattg atttggaacc tttctgtaga tgtcatagtc    4920

acatggggaa gcttgttaaa gtcccaggct cagtggactt tgggtgtggt gcaggatctg    4980

ccatttaata agcttccttg gagactctgg ggttgagaga ttcaaagacc ataaccctct    5040

tggtggtccc ttagctgcca agtctacgca aaatggccaa atggagcctt tcttctcctt    5100

gtcctctaca ggcacaccaa gatgaagaca gctaccaaca tttacatatt taatctggca    5160

ctggctgata ccctggtctt gctaacactg cccttccagg gcacagacat cctactgggc    5220
```

62

```
ttctggccat ttgggaatgc actctgcaag actgtcattg ctatcgacta ctacaacatg   5280

tttaccagca cttttactct gaccgccatg agcgtagacc gctatgtggc tatctgccac   5340

cctatccgtg cccttgatgt tcggacatcc agcaaagccc aggctgttaa tgtggccata   5400

tgggccctgg cttcagtggt tggtgttcct gttgccatca tgggttcagc acaagtggaa   5460

gatgaaggtc agtgggtggt cctcctccct gactcattag tttcccatgg ttcttgctgg   5520

tccctctgac cccatttctc tcctgcagag atcgagtgcc tggtggagat ccctgcccct   5580

caggactatt ggggccctgt attcgccatc tgcatcttcc ttttttcctt catcatccct   5640

gtgctgatca tctctgtctg ctacagcctc atgattcgac gacttcgtgg tgtccgtctg   5700

ctttcaggct cccgggagaa ggaccgaaac ctgcggcgta tcactcgact ggtgctggta   5760

gtggtggctg tgtttgtggg ctgctggacg cctgtgcagg tgtttgtcct ggttcaagga   5820

ctgggtgttc agccaggtag tgagactgca gttgccatcc tgcgcttctg cacagccctg   5880

ggctatgtca acagttgtct caatcccatt ctctatgctt tcctggatga gaacttcaag   5940

gcctgcttta gaaagttctg ctgtgcttca tccctgcacc gggagatgca ggtttctgat   6000

cgtgtgcgga gcattgccaa ggatgttggc cttggttgca agacttctga gacagtacca   6060

cggccagcat gactaggcgt ggacctgccc atggtgcctg tcagcccaca gagcccatct   6120

acacccaaca cggagctcac acaggtcact gctctctagg ttgaccctga accttgagca   6180

tctggagcct tgaatggctt ttcttttgga tcaggatgct cagtcctaga ggaagacctt   6240

ttagcaccat gggacaggtc aaagcatcaa ggtggtctcc atggcctctg tcagattaag   6300

ttccctccct ggtataggac cagagaggac caaaggaact gaatagaaac atccacaaca   6360

cagtggacat gcctggtgag cccatgtagg tattcatgct tcacttgact cttctctggc   6420

ttctccctgc tgccctggct ctagctgggc tcaacctgag gtattgtagt ggtcatgtag   6480

tcactcttgt gactacatgt tgtgtgctgt tgctctcggc ctttcagtat ttccacagga   6540

ctgctgaaca tacctggtat tgcagtgggg agcattaatt ttcttttaaa gtgagactgg   6600

cccttaagct tggcgttgcc ttggagcgtc ttctacttct gacttcactg atgcagtcag   6660

attacccgag ggtgagcatc agtggtttct tggatggctg ttttctgaag attcttccca   6720

tccagtacat ggagtctatg aagggagtca caattcatct ggtactgcca ctacctgctc   6780

tataatcctg ggctatcttc ttggcaagat gacagtgggg gagacaagac acagagcttc   6840

cctaaggctc tttccctcca aaaccactgt gaactcttat cctacagact gttcggcaag   6900
```

63

```
cactgcttct aggtgtgtgg gaggtaatca ggagaaagct ttgtggcctc tgtaggctgc      6960

tcacaacatg gaggcaccac atgctggtct tgcctgctta gtacaggcag gacagagcag      7020

aatatgctct ctctcgattc tctacaaact ccctcagttc tccagcagag tctcttttac      7030

ttgctatcag aggtcaggag ttgtactgct agaagcatac ttgtagcttg ggaagagtgg      7140

cagtcaggat gtgttctact ctatatccac agtgaccacc tgcttcatat atagggttag      7200

gacatatctg agtaaggcct gagtgtgctg ccaaattgga ggttggtatg agagctgatg      7260

cctaaagtgg ctcatttgca aggactatta tggtttggaa tagcaatggg cactggtcgg      7320

cgaagaagag tctatacctt cgagatctat ttgatggttc acagaagagg ttttgtcaaa      7380

cgcccttcta tgggtcagat atcaaaatac cagcaacgtt ggatagattc tgacctttta      7440

ctgagacctc ggtcagatgg tttcatgtca tgcagagaac ctaggctggt tcctgtgtca      7500

gagagacctg ggcttctggg gaggccaggg ttcttccttt gacacttgtg cgggacgcgt      7560

tagctctaga gttttcttgc taatgctaag aaactttgtg aatttgtata tctttatgta      7620

tttaagcatg caacaagcgt catttccatg catgtagcta gccctgaacc tgcctctggg      7680

gtaatgaagg agtgctcata acaaacactt atccagtgac cagtactgtc catagcctaa      7740

gtgtttctga ctccagctac ataagagtaa cttcctgggt attgatatgc actgggatga      7800

ggcacagaac caggttcatg ggttttaaac ctgttctgcc cttgcaaggg actttaagga      7860

acttcttgat tgatgggagg aaaactagtt cctgggttgc agaggctgct gcctttcctt      7920

ctcccaagac aatgactatc ttttctcccc acactcagga acagtgggta gatgcctttc      7980

ttcacagttt ttctttgtag actcttgctg cttgagcaaa tctaaaagga gttgtggtga      8040

tcagagcaga ggacccttct ctggtggcag agcaacccta tgctatagag atctaccccc      8100

tggctcttgt ctgtgtaggc ccaatctggc tcaattgacc ctctggcaga tggcccttat      8160

caggggggct ttgaagaggg tcttacttgc caaagcgctt gctttcagta cagagctggt      8220

gagccaaagc ttggttttat acaagtttta atgacattgt ccatttgttt tttgtttttt      8280

agtctagcag tttataatca aaaggtatga atttctaata ggcttaaaag atgcagccca      8340

tgcaggcatg gtggattgga ttctatgaga tt                                    8372
```

<210>   10
<211>   1566
<212>   DNA

<213> Rattus norvegicus

<400> 10
```
ctgcacagcc cctccttctc tcagccgcag ccttctgccc ctcccccttc tggctgccgc    60

accggctgct gcgtctagtc aatatcttat cttccgagca ggagctagga gccattccca   120

gccgcagcag accccaatct agagtgagag tcattgctca gtccactgtg ctcctgcctg   180

cccgcctttc tgctaagcat tggggtctat tttggcccag cttctgaaga ggctgtgtgt   240

gccgttggag gaactgtact gagtggcttt gcagggtgac agcatggagt ccctctttcc   300

tgctccatac tgggaggtct tgtatggcag ccactttcaa gggaacctgt ccctcctaaa   360

tgagaccgta ccccaccacc tgctcctcaa tgctagtcac agcgccttcc tgccccttgg   420

actcaaggtc accatcgtgg ggctctactt ggctgtgtgc atcggggggc tcctggggaa   480

ctgcctcgtc atgtatgtca tcctcagctg ggagggcatt gaggggggact ggagacagca   540

gacaatactg tgcagttgga agacacagat ctttgatgaa ctttacaggc agtgccctga   600

aaagcctctg agagaagtct taagagagac tgaggagaga agacagcatc tctctctctt   660

gattcattcc acaaactcac attcaggcac accaagatga agacagctac caacatttac   720

atatttaatc tggcactggc tgataccctg gtcttgctaa cactgccctt ccagggcaca   780

gacatcctac tgggcttctg gccatttggg aatgcactct gcaagactgt cattgctatc   840

gactactaca acatgtttac cagcactttt actctgaccg ccatgagcgt agaccgctat   900

gtggctatct gccaccctat ccgtgccctt gatgttcgga catccagcaa agcccaggct   960

gttaatgtgg ccatatgggc cctggcttca gtggttggtg ttcctgttgc catcatgggt  1020

tcagcacaag tggaagatga agagatcgag tgcctggtgg agatccctgc ccctcaggac  1080

tattggggcc ctgtattcgc catctgcatc ttcctttttt ccttcatcat ccctgtgctg  1140

atcatctctg tctgctacag cctcatgatt cgacgacttc gtggtgtccg tctgctttca  1200

ggctcccggg agaaggaccg aaacctgcgg cgtatcactc gactggtgct ggtagtggtg  1260

gctgtgtttg tgggctgctg gacgcctgtg caggtgtttg tcctggttca aggactgggt  1320

gttcagccag gtagtgagac tgcagttgcc atcctgcgct tctgcacagc cctgggctat  1380

gtcaacagtt gtctcaatcc cattctctat gctttcctgg atgagaactt caaggcctgc  1440

tttagaaagt tctgctgtgc ttcatccctg caccgggaga tgcaggtttc tgatcgtgtg  1500

cggagcattg ccaaggatgt tggccttggt tgcaagactt ctgagacagt accacggcca  1560
```

65

gcatga   1566

<210> 11
<211> 138
<212> PRT
<213> Rattus norvegicus

<400> 11

Met Glu Ser Leu Phe Pro Ala Pro Tyr Trp Glu Val Leu Tyr Gly Ser
1   5   10   15

His Phe Gln Gly Asn Leu Ser Leu Leu Asn Glu Thr Val Pro His His
                20   25   30

Leu Leu Leu Asn Ala Ser His Ser Ala Phe Leu Pro Leu Gly Leu Lys
            35   40   45

Val Thr Ile Val Gly Leu Tyr Leu Ala Val Cys Ile Gly Gly Leu Leu
        50   55   60

Gly Asn Cys Leu Val Met Tyr Val Ile Leu Ser Trp Glu Gly Ile Glu
65   70   75   80

Gly Asp Trp Arg Gln Gln Thr Ile Leu Cys Ser Trp Lys Thr Gln Ile
                85   90   95

Phe Asp Glu Leu Tyr Arg Gln Cys Pro Glu Lys Pro Leu Arg Glu Val
                100   105   110

Leu Arg Glu Thr Glu Glu Arg Arg Gln His Leu Ser Leu Leu Ile His
        115   120   125

Ser Thr Asn Ser His Ser Gly Thr Pro Arg
        130   135

<210> 12
<211> 1421
<212> DNA
<213> Rattus norvegicus

<400> 12
ctgcacagcc cctccttctc tcagccgcag ccttctgccc ctccccttc tggctgccgc   60

accggctgct gcgtctagtc aatatcttat cttccgagca ggagctagga gccattccca   120

gccgcagcag accccaatct agagtgagag tcattgctca gtccactgtg ctcctgcctg   180

cccgcctttc tgctaagcat tggggtctat tttggcccag cttctgaaga ggctgtgtgt   240

gccgttggag gaactgtact gagtggcttt gcagggtgac agcatggagt ccctcttccc   300

tgctccatac tgggaggtct tgtatggcag ccactttcaa gggaacctgt ccctcctaaa   360

```
       tgagaccgta ccccaccacc tgctcctcaa tgctagtcac agcgccttcc tgccccttgg      420

       actcaaggtc accatcgtgg ggctctactt ggctgtgtgc atcgggggggc tcctggggaa      480

    5  ctgcctcgtc atgtatgtca tcctcagctg ggagggcatt gagggggact ggagacagca      540

       ggcacaccaa gatgaagaca gctaccaaca tttacatatt taatctggca ctggctgata      600

       ccctggtctt gctaacactg cccttccagg gcacagacat cctactgggc ttctggccat      660
   10  ttgggaatgc actctgcaag actgtcattg ctatcgacta ctacaacatg tttaccagca      720

       cttttactct gaccgccatg agcgtagacc gctatgtggc tatctgccac cctatccgtg      780

   15  cccttgatgt tcggacatcc agcaaagccc aggctgttaa tgtggccata tgggccctgg      840

       cttcagtggt tggtgttcct gttgccatca tgggttcagc acaagtggaa gatgaagaga      900

       tcgagtgcct ggtggagatc cctgcccctc aggactattg gggccctgta ttcgccatct      960
   20  gcatcttcct tttttccttc atcatccctg tgctgatcat ctctgtctgc tacagcctca     1020

       tgattcgacg acttcgtggt gtccgtctgc tttcaggctc ccgggagaag gaccgaaacc     1080

   25  tgcggcgtat cactcgactg gtgctggtag tggtggctgt gtttgtgggc tgctggacgc     1140

       ctgtgcaggt gtttgtcctg gttcaaggac tgggtgttca gccaggtagt gagactgcag     1200

       ttgccatcct gcgcttctgc acagccctgg gctatgtcaa cagttgtctc aatcccattc     1260
   30  tctatgcttt cctggatgag aacttcaagg cctgctttag aaagttctgc tgtgcttcat     1320

       ccctgcaccg ggagatgcag gtttctgatc gtgtgcggag cattgccaag gatgttggcc     1380

   35  ttggttgcaa gacttctgag acagtaccac ggccagcatg a                         1421


       <210>   13
       <211>   99
   40  <212>   PRT
       <213>   Rattus norvegicus

       <400>   13

   45  Met Glu Ser Leu Phe Pro Ala Pro Tyr Trp Glu Val Leu Tyr Gly Ser
       1               5                   10                  15

       His Phe Gln Gly Asn Leu Ser Leu Leu Asn Glu Thr Val Pro His His
                       20                  25                  30
   50
       Leu Leu Leu Asn Ala Ser His Ser Ala Phe Leu Pro Leu Gly Leu Lys
                   35                  40                  45

       Val Thr Ile Val Gly Leu Tyr Leu Ala Val Cys Ile Gly Gly Leu Leu
   55          50                  55                  60

                                        67
```

Gly Asn Cys Leu Val Met Tyr Val Ile Leu Ser Trp Glu Gly Ile Glu
65   70   75   80

Gly Asp Trp Arg Gln Gln Ala His Gln Asp Glu Asp Ser Tyr Gln His
                85   90   95

Leu His Ile

<210> 14
<211> 1387
<212> DNA
<213> Rattus norvegicus

<400> 14
ctgcacagcc cctccttctc tcagccgcag ccttctgccc ctccccttc tggctgccgc   60

accggctgct gcgtctagtc aatatcttat cttccgagca ggagctagga gccattccca   120

gccgcagcag accccaatct agagtgagag tcattgctca gtccactgtg ctcctgcctg   180

cccgcctttc tgctaagcat tggggtctat tttggcccag cttctgaaga ggctgtgtgt   240

gccgttggag gaactgtact gagtggcttt gcaggtgac agcatggagt ccctctttcc   300

tgctccatac tgggaggtct tgtatggcag ccactttcaa gggaacctgt ccctcctaaa   360

tgagaccgta ccccaccacc tgctcctcaa tgctagtcac agcgccttcc tgccccttgg   420

actcaaggtc accatcgtgg ggctctactt ggctgtgtgc atcgggggggc tcctggggaa   480

ctgcctcgtc atgtatgtca tcctcaggca caccaagatg aagacagcta ccaacattta   540

catatttaat ctggcactgg ctgataccct ggtcttgcta acactgccct tccagggcac   600

agacatccta ctgggcttct ggccatttgg gaatgcactc tgcaagactg tcattgctat   660

cgactactac aacatgttta ccagcacttt tactctgacc gccatgagcg tagaccgcta   720

tgtggctatc tgccacccta tccgtgccct tgatgttcgg acatccagca agcccaggc   780

tgttaatgtg gccatatggg ccctggcttc agtggttggt gttcctgttg ccatcatggg   840

ttcagcacaa gtggaagatg aagagatcga gtgcctggtg agatccctg ccccctcagga   900

ctattggggc cctgtattcg ccatctgcat cttcctttt tccttcatca tccctgtgct   960

gatcatctct gtctgctaca gcctcatgat tcgacgactt cgtggtgtcc gtctgctttc   1020

aggctcccgg gagaaggacc gaaacctgcg gcgtatcact cgactggtgc tggtagtggt   1080

ggctgtgttt gtgggctgct ggacgcctgt gcaggtgttt gtcctggttc aaggactggg   1140

tgttcagcca ggtagtgaga ctgcagttgc catcctgcgc ttctgcacag ccctgggcta   1200

68

tgtcaacagt tgtctcaatc ccattctcta tgctttcctg gatgagaact tcaaggcctg   1260

ctttagaaag ttctgctgtg cttcatccct gcaccgggag atgcaggttt ctgatcgtgt   1320

gcggagcatt gccaaggatg ttggccttgg ttgcaagact tctgagacag taccacggcc   1380

agcatga   1387

<210>   15
<211>   367
<212>   PRT
<213>   Rattus norvegicus

<400>   15

Met Glu Ser Leu Phe Pro Ala Pro Tyr Trp Glu Val Leu Tyr Gly Ser
1   5   10   15

His Phe Gln Gly Asn Leu Ser Leu Leu Asn Glu Thr Val Pro His His
                20   25   30

Leu Leu Leu Asn Ala Ser His Ser Ala Phe Leu Pro Leu Gly Leu Lys
            35   40   45

Val Thr Ile Val Gly Leu Tyr Leu Ala Val Cys Ile Gly Gly Leu Leu
        50   55   60

Gly Asn Cys Leu Val Met Tyr Val Ile Leu Arg His Thr Lys Met Lys
65   70   75   80

Thr Ala Thr Asn Ile Tyr Ile Phe Asn Leu Ala Leu Ala Asp Thr Leu
                85   90   95

Val Leu Leu Thr Leu Pro Phe Gln Gly Thr Asp Ile Leu Leu Gly Phe
                100   105   110

Trp Pro Phe Gly Asn Ala Leu Cys Lys Thr Val Ile Ala Ile Asp Tyr
            115   120   125

Tyr Asn Met Phe Thr Ser Thr Phe Thr Leu Thr Ala Met Ser Val Asp
        130   135   140

Arg Tyr Val Ala Ile Cys His Pro Ile Arg Ala Leu Asp Val Arg Thr
145   150   155   160

Ser Ser Lys Ala Gln Ala Val Asn Val Ala Ile Trp Ala Leu Ala Ser
                165   170   175

Val Val Gly Val Pro Val Ala Ile Met Gly Ser Ala Gln Val Glu Asp
            180   185   190

Glu Glu Ile Glu Cys Leu Val Glu Ile Pro Ala Pro Gln Asp Tyr Trp
            195   200   205

69

```
        Gly Pro Val Phe Ala Ile Cys Ile Phe Leu Phe Ser Phe Ile Ile Pro
            210                 215                 220

  5     Val Leu Ile Ile Ser Val Cys Tyr Ser Leu Met Ile Arg Arg Leu Arg
            225                 230                 235                 240

        Gly Val Arg Leu Leu Ser Gly Ser Arg Glu Lys Asp Arg Asn Leu Arg
                        245                 250                 255
 10
        Arg Ile Thr Arg Leu Val Leu Val Val Val Ala Val Phe Val Gly Cys
                        260                 265                 270

        Trp Thr Pro Val Gln Val Phe Val Leu Val Gln Gly Leu Gly Val Gln
 15                 275                 280                 285

        Pro Gly Ser Glu Thr Ala Val Ala Ile Leu Arg Phe Cys Thr Ala Leu
            290                 295                 300

 20     Gly Tyr Val Asn Ser Cys Leu Asn Pro Ile Leu Tyr Ala Phe Leu Asp
            305                 310                 315                 320

        Glu Asn Phe Lys Ala Cys Phe Arg Lys Phe Cys Cys Ala Ser Ser Leu
                        325                 330                 335
 25
        His Arg Glu Met Gln Val Ser Asp Arg Val Arg Ser Ile Ala Lys Asp
                        340                 345                 350

        Val Gly Leu Gly Cys Lys Thr Ser Glu Thr Val Pro Arg Pro Ala
 30                 355                 360                 365

        <210>  16
        <211>  1372
        <212>  DNA
 35     <213>  Rattus norvegicus

        <400>  16
        ctgcacagcc cctccttctc tcagccgcag ccttctgccc ctcccccttc tggctgccgc     60

 40     accggctgct gcgtctagtc aatatcttat cttccgagca ggagctagga gccattccca    120

        gccgcagcag accccaatct agagtgagag tcattgctca gtccactgtg ctcctgcctg    180

        cccgcctttc tgctaagcat tggggtctat tttggcccag cttctgaaga ggctgtgtgt    240
 45
        gccgttggag gaactgtact gagtggcttt gcagggtgac agcatggagt ccctctttcc    300

        tgctccatac tgggaggtct tgtatggcag ccactttcaa gggaacctgt ccctcctaaa    360

 50     tgagaccgta ccccaccacc tgctcctcaa tgctagtcac agcgccttcc tgccccttgg    420

        actcaaggtc accatcgtgg ggctctactt ggctgtgtgc atcggggggc tcctggggaa    480

        ctgcctcgtc atgcacacca agatgaagac agctaccaac atttacatat ttaatctggc    540
 55
```

70

actggctgat accctggtct tgctaacact gcccttccag ggcacagaca tcctactggg 600

cttctggcca tttgggaatg cactctgcaa gactgtcatt gctatcgact actacaacat 660

gtttaccagc acttttactc tgaccgccat gagcgtagac cgctatgtgg ctatctgcca 720

ccctatccgt gcccttgatg ttcggacatc cagcaaagcc caggctgtta atgtggccat 780

atgggccctg gcttcagtgg ttggtgttcc tgttgccatc atgggttcag cacaagtgga 840

agatgaagag atcgagtgcc tggtggagat ccctgcccct caggactatt ggggccctgt 900

attcgccatc tgcatcttcc tttttttcctt catcatccct gtgctgatca tctctgtctg 960

ctacagcctc atgattcgac gacttcgtgg tgtccgtctg ctttcaggct cccgggagaa 1020

ggaccgaaac ctgcggcgta tcactcgact ggtgctggta gtggtggctg tgtttgtggg 1080

ctgctggacg cctgtgcagg tgtttgtcct ggttcaagga ctgggtgttc agccaggtag 1140

tgagactgca gttgccatcc tgcgcttctg cacagccctg ggctatgtca cagttgtct 1200

caatcccatt ctctatgctt tcctggatga gaacttcaag gcctgcttta gaaagttctg 1260

ctgtgcttca tccctgcacc gggagatgca ggtttctgat cgtgtgcgga gcattgccaa 1320

ggatgttggc cttggttgca agacttctga gacagtacca cggccagcat ga 1372

<210> 17
<211> 362
<212> PRT
<213> Rattus norvegicus

<400> 17

Met Glu Ser Leu Phe Pro Ala Pro Tyr Trp Glu Val Leu Tyr Gly Ser
1   5   10   15

His Phe Gln Gly Asn Leu Ser Leu Leu Asn Glu Thr Val Pro His His
                20   25   30

Leu Leu Leu Asn Ala Ser His Ser Ala Phe Leu Pro Leu Gly Leu Lys
            35   40   45

Val Thr Ile Val Gly Leu Tyr Leu Ala Val Cys Ile Gly Gly Leu Leu
        50   55   60

Gly Asn Cys Leu Val Met His Thr Lys Met Lys Thr Ala Thr Asn Ile
65   70   75   80

Tyr Ile Phe Asn Leu Ala Leu Ala Asp Thr Leu Val Leu Leu Thr Leu
                85   90   95

Pro Phe Gln Gly Thr Asp Ile Leu Leu Gly Phe Trp Pro Phe Gly Asn

71

```
                    100                 105                 110

      Ala Leu Cys Lys Thr Val Ile Ala Ile Asp Tyr Tyr Asn Met Phe Thr
                115                 120                 125
5

      Ser Thr Phe Thr Leu Thr Ala Met Ser Val Asp Arg Tyr Val Ala Ile
                130                 135                 140

      Cys His Pro Ile Arg Ala Leu Asp Val Arg Thr Ser Ser Lys Ala Gln
10    145                 150                 155                 160

      Ala Val Asn Val Ala Ile Trp Ala Leu Ala Ser Val Val Gly Val Pro
                165                 170                 175

15    Val Ala Ile Met Gly Ser Ala Gln Val Glu Asp Glu Glu Ile Glu Cys
                180                 185                 190

      Leu Val Glu Ile Pro Ala Pro Gln Asp Tyr Trp Gly Pro Val Phe Ala
                195                 200                 205
20

      Ile Cys Ile Phe Leu Phe Ser Phe Ile Ile Pro Val Leu Ile Ile Ser
                210                 215                 220

      Val Cys Tyr Ser Leu Met Ile Arg Arg Leu Arg Gly Val Arg Leu Leu
25    225                 230                 235                 240

      Ser Gly Ser Arg Glu Lys Asp Arg Asn Leu Arg Arg Ile Thr Arg Leu
                245                 250                 255

30    Val Leu Val Val Val Ala Val Phe Val Gly Cys Trp Thr Pro Val Gln
                260                 265                 270

      Val Phe Val Leu Val Gln Gly Leu Gly Val Gln Pro Gly Ser Glu Thr
                275                 280                 285
35

      Ala Val Ala Ile Leu Arg Phe Cys Thr Ala Leu Gly Tyr Val Asn Ser
                290                 295                 300

      Cys Leu Asn Pro Ile Leu Tyr Ala Phe Leu Asp Glu Asn Phe Lys Ala
40    305                 310                 315                 320

      Cys Phe Arg Lys Phe Cys Cys Ala Ser Ser Leu His Arg Glu Met Gln
                325                 330                 335

45    Val Ser Asp Arg Val Arg Ser Ile Ala Lys Asp Val Gly Leu Gly Cys
                340                 345                 350

      Lys Thr Ser Glu Thr Val Pro Arg Pro Ala
                355                 360
50
      <210>  18
      <211>  439
      <212>  DNA
      <213>  Rattus norvegicus
55
```

72

<400> 18

```
gctcatggag gcgttcatgt gcctgttagt gtagttgtgc tgtgttctaa ggcctcagtg      60

gacggtgtct agcactgtgg ttacttgttt ctgtgccctg ttccaggaac tgtactgagt     120

ggctttgcag ggtgacagca tggagtccct ctttcctgct ccatactggg aggtcttgta     180

tggcagccac tttcaaggga acctgtccct cctaaatgag accgtacccc accacctgct     240

cctcaatgct agtcacagcg ccttcctgcc ccttggactc aaggtcacca tcgtgggggct    300

ctacttggct gtgtgcatcg gggggctcct ggggaactgc ctcgtcatgt atgtcatcct     360

cagctgggag ggcattgagg gggactggag acagcaggca caccaagatg aagacagcta     420

ccaacattta catatttaa                                                  439
```

<210>   19
<211>   1243
<212>   DNA
<213>   Rattus norvegicus

<400>   19

```
gctcatggag gcgttcatgt gcctgttagt gtagttgtgc tgtgttctaa ggcctcagtg      60

gacggtgtct agcactgtgg ttacttgttt ctgtgccctg ttccaggaac tgtactgagt     120

ggctttgcag ggtgacagca tggagtccct ctttcctgct ccatactggg aggtcttgta     180

tggcagccac tttcaaggga acctgtccct cctaaatgag accgtacccc accacctgct     240

cctcaatgct agtcacagcg ccttcctgcc ccttggactc aaggtcacca tcgtgggggct    300

ctacttggct gtgtgcatcg gggggctcct ggggaactgc ctcgtcatgt atgtcatcct     360

caggcacacc aagatgaaga cagctaccaa catttacata tttaatctgg cactggctga     420

taccctggtc ttgctaacac tgcccttcca gggcacagac atcctactgg gcttctggcc     480

atttgggaat gcactctgca agactgtcat tgctatcgac tactacaaca tgtttaccag     540

cacttttact ctgaccgcca tgagcgtaga ccgctatgtg gctatctgcc accctatccg     600

tgcccttgat gttcggacat ccagcaaagc ccaggctgtt aatgtggcca tatgggccct     660

ggcttcagtg gttggtgttc ctgttgccat catgggttca gcacaagtgg aagatgaaga     720

gatcgagtgc ctggtggaga tccctgcccc tcaggactat ggggccctg tattcgccat      780

ctgcatcttc cttttttcct tcatcatccc tgtgctgatc atctctgtct gctacagcct     840

catgattcga cgacttcgtg gtgtccgtct gctttcaggc tcccgggaga aggaccgaaa     900

cctgcggcgt atcactcgac tggtgctggt agtggtggct gtgtttgtgg gctgctggac     960
```

73

gcctgtgcag gtgtttgtcc tggttcaagg actgggtgtt cagccaggta gtgagactgc   1020

agttgccatc ctgcgcttct gcacagccct gggctatgtc aacagttgtc tcaatcccat   1080

tctctatgct ttcctggatg agaacttcaa ggcctgcttt agaaagttct gctgtgcttc   1140

atccctgcac cgggagatgc aggtttctga tcgtgtgcgg agcattgcca aggatgttgg   1200

ccttggttgc aagacttctg agacagtacc acggccagca tga   1243

<210> 20
<211> 1228
<212> DNA
<213> Rattus norvegicus

<400> 20
gctcatggag gcgttcatgt gcctgttagt gtagttgtgc tgtgttctaa ggcctcagtg   60

gacggtgtct agcactgtgg ttacttgttt ctgtgccctg ttccaggaac tgtactgagt   120

ggctttgcag ggtgacagca tggagtccct ctttcctgct ccatactggg aggtcttgta   180

tggcagccac tttcaaggga acctgtccct cctaaatgag accgtacccc accacctgct   240

cctcaatgct agtcacagcg ccttcctgcc ccttggactc aaggtcacca tcgtggggct   300

ctacttggct gtgtgcatcg gggggctcct ggggaactgc ctcgtcatgc acaccaagat   360

gaagacagct accaacattt acatatttaa tctggcactg gctgataccc tggtcttgct   420

aacactgccc ttccagggca cagacatcct actgggcttc tggccatttg ggaatgcact   480

ctgcaagact gtcattgcta tcgactacta caacatgttt accagcactt ttactctgac   540

cgccatgagc gtagaccgct atgtggctat ctgccaccct atccgtgccc ttgatgttcg   600

gacatccagc aaagcccagg ctgttaatgt ggccatatgg gccctggctt cagtggttgg   660

tgttcctgtt gccatcatgg gttcagcaca agtggaagat aagagatcg agtgcctggt   720

ggagatccct gcccctcagg actattgggg ccctgtattc gccatctgca tcttcctttt   780

ttccttcatc atccctgtgc tgatcatctc tgtctgctac agcctcatga ttcgacgact   840

tcgtggtgtc cgtctgcttt caggctcccg ggagaaggac cgaaacctgc ggcgtatcac   900

tcgactggtg ctggtagtgg tggctgtgtt tgtgggctgc tggacgcctg tgcaggtgtt   960

tgtcctggtt caaggactgg gtgttcagcc aggtagtgag actgcagttg ccatcctgcg   1020

cttctgcaca gccctgggct atgtcaacag ttgtctcaat cccattctct atgctttcct   1080

ggatgagaac ttcaaggcct gctttagaaa gttctgctgt gcttcatccc tgcaccggga   1140

74

```
gatgcaggtt tctgatcgtg tgcggagcat tgccaaggat gttggccttg gttgcaagac   1200

ttctgagaca gtaccacggc cagcatga                                       1228
```

<210>   21
<211>   887
<212>   DNA
<213>   Rattus norvegicus

<400>   21
```
gctcatggag gcgttcatgt gcctgttagt gtagttgtgc tgtgttctaa ggcctcagtg    60

gacggtgtct agcactgtgg ttacttgttt ctgtgccctg ttccaggaac tgtactgagt   120

ggctttgcag ggtgacagca tggagtccct ctttcctgct ccatactggg aggtcttgta   180

tggcagccac tttcaaggga acctgtccct cctaaatgag accgtacccc accacctgct   240

cctcaatgct agtcacagcg ccttcctgcc ccttggactc aaggtcacca tcgtggggct   300

ctacttggct gtgtgcatcg gggggctcct ggggaactgc ctcgtcatgt atgtcatcct   360

cagagatcga gtgcctggtg gagatccctg cccctcagga ctattggggc cctgtattcg   420

ccatctgcat cttccttttt tccttcatca tccctgtgct gatcatctct gtctgctaca   480

gcctcatgat tcgacgactt cgtggtgtcc gtctgctttc aggctcccgg gagaaggacc   540

gaaacctgcg gcgtatcact cgactggtgc tggtagtggt ggctgtgttt gtgggctgct   600

ggacgcctgt gcaggtgttt gtcctggttc aaggactggg tgttcagcca ggtagtgaga   660

ctgcagttgc catcctgcgc ttctgcacag ccctgggcta tgtcaacagt tgtctcaatc   720

ccattctcta tgctttcctg gatgagaact tcaaggcctg ctttagaaag ttctgctgtg   780

cttcatccct gcaccgggag atgcaggttt ctgatcgtgt gcggagcatt gccaaggatg   840

ttggccttgg ttgcaagact tctgagacag taccacggcc agcatga                 887
```

<210>   22
<211>   2534
<212>   DNA
<213>   Homo sapiens

<400>   22
```
cctgctctgc acctgtcgtc gactgccagc cggctgaggg cgggggtctc cacggtggtc    60

ccagctccca aggaggttgc agaagtaccg tacagagtgg atttgcaggg cagtggcatg   120

gagcccctct tccccgcgcc gttctgggag gttatctacg gcagccacct tcagggcaac   180
```

75

```
ctgtccctcc tgagccccaa ccacagtctg ctgcccccgc atctgctgct caatgccagc    240

cacggcgcct tcctgcccct cgggctcaag gtcaccatcg tggggctcta cctggccgtg    300

tgtgtcggag ggctcctggg gaactgcctt gtcatgtacg tcatcctcag gcacaccaaa    360

atgaagacag ccaccaatat ttacatcttt aacctggccc tggccgacac tctggtcctg    420

ctgacgctgc ccttccaggg cacggacatc ctcctgggct tctggccgtt tgggaatgcg    480

ctgtgcaaga cagtcattgc cattgactac tacaacatgt tcaccagcac cttcacccta    540

actgccatga gtgtggatcg ctatgtagcc atctgccacc ccatccgtgc cctcgacgtc    600

cgcacgtcca gcaaagccca ggctgtcaat gtggccatct gggccctggc ctctgttgtc    660

ggtgttcccg ttgccatcat gggctcggca caggtcgagg atgaagagat cgagtgcctg    720

gtggagatcc ctacccctca ggattactgg ggcccggtgt ttgccatctg catcttcctc    780

ttctccttca tcgtccccgt gctcgtcatc tctgtctgct acagcctcat gatccggcgg    840

ctccgtggag tccgcctgct ctcgggctcc cgagagaagg accggaacct gcggcgcatc    900

actcggctgg tgctggtggt agtggctgtg ttcgtgggct gctggacgcc tgtccaggtc    960

ttcgtgctgg cccaagggct gggggttcag ccgagcagcg agactgccgt ggccattctg   1020

cgcttctgca cggccctggg ctacgtcaac agctgcctca accccatcct ctacgccttc   1080

ctggatgaga acttcaaggc ctgcttccgc aagttctgct gtgcatctgc cctgcgccgg   1140

gacgtgcagg tgtctgaccg cgtgcgcagc attgccaagg acgtggccct ggcctgcaag   1200

acctctgaga cggtaccgcg gcccgcatga ctaggcgtgg acctgcccat ggtgcctgtc   1260

agcccgcaga gcccatctac gcccaacaca gagctcacac aggtcactgc tctctaggcg   1320

gacacaccct gggccctgag catccagagc ctgggatggg cttttccctg tgggccaggg   1380

atgctcggtc ccagaggagg acctagtgac atcatgggac aggtcaaagc attagggcca   1440

cctccatggc cccagacaga ctaaagctgc cctcctggtg cagggccgag gggacacaag   1500

gacctacctg gaagcagctg acatgctggt ggacggccgt tactggagcc cgtgcccctc   1560

cctccccgtg cttcatgtga ctcttggcct ctctgctgct gcgttggcag aaccctgggt   1620

gggcaggcac ccggaggagg agcagcagct gtgtcatcct gtgcccccca tgtgctgtgt   1680

gctgtttgca tggcagggct ccagctgcct tcagccctgt gacgtctcct cagggcagct   1740

ggacaggctt ggcacggccc gggaagtgca gcaggcagct tttctttggg gtgggacttg   1800

ccctgagctt ggagctgcca cctggaggac ttgcctgttc cgactccacc tgtgcagccg   1860
```

76

```
gggccacccc aggagaaagt gtccaggtgg gggctggcag tccctggctg cagaccccga     1920

gctggccctc ggaccgcacc tctgaaggtt ttctgtgtgc tgcacggtgc aggcctcatc     1980

cctgactgca gcttgactct gggcccaacc cccatttccc ttcaggagac cagcgagagg     2040

ccctggccat ccctccagcg gtgcaatgaa ctatatgctg tggaccgtca acccagccct     2100

gcttctcagt gtggggcagg tgtctcagga cgaaggcgcc gcgtgaccac atgggcagct     2160

ctgttcacaa agtggaggcc tcgtttttcct ggtcttgact gctctgtttg ggtgggagaa    2220

gattctctgg gggtccccac atcctcccaa ggctccctc acagcctctc ctttgcttga      2280

agccagaggt cagtggccgt gctgtgttgc ggggaagctg tgtggaagga gaagctggtg     2340

gccacagcag agtcctgctc tggggacgcc tgcttcattt acaagcctca agatggctct     2400

gtgtagggcc tgagcttgct gcccaacggg aggatggctt cacagcagag ccagcatgag     2460

gggtggggcc tggcagggct tgcttgagcc aaactgcaaa ggctgtggtg gctgtgagga     2520

cactgcgggg gttg                                                       2534
```

<210> 23
<211> 171
<212> PRT
<213> Rattus norvegicus

<400> 23

```
Met Glu Ser Leu Phe Pro Ala Pro Tyr Trp Glu Val Leu Tyr Gly Ser
1               5                   10                  15

His Phe Gln Gly Asn Leu Ser Leu Leu Asn Glu Thr Val Pro His His
            20                  25                  30

Leu Leu Leu Asn Ala Ser His Ser Ala Phe Leu Pro Leu Gly Leu Lys
            35                  40                  45

Val Thr Ile Val Gly Leu Tyr Leu Ala Val Cys Ile Gly Gly Leu Leu
            50                  55                  60

Gly Asn Cys Leu Val Met Tyr Val Ile Leu Arg Asp Arg Val Pro Gly
65                  70                  75                  80

Gly Asp Pro Cys Pro Ser Gly Leu Leu Gly Pro Cys Ile Arg His Leu
                85                  90                  95

His Leu Pro Phe Phe Leu His His Pro Cys Ala Asp His Leu Cys Leu
            100                 105                 110

Leu Gln Pro His Asp Ser Thr Thr Ser Trp Cys Pro Ser Ala Phe Arg
```

77
```

```
          115                    120                    125

Leu Pro Gly Glu Gly Pro Lys Pro Ala Ala Tyr His Ser Thr Gly Ala
        130                 135                 140

Gly Ser Gly Gly Cys Val Cys Gly Leu Leu Asp Ala Cys Ala Gly Val
145                 150                 155                 160

Cys Pro Gly Ser Arg Thr Gly Cys Ser Ala Arg
                    165                 170


<210>   24
<211>   17
<212>   PRT
<213>   Rattus norvegicus


<400>   24

Phe Gly Gly Phe Thr Gly Ala Arg Lys Ser Ala Arg Lys Leu Ala Asn
1                   5                   10                  15

Gln


<210>   25
<211>   35
<212>   DNA
<213>   Rattus norvegicus

<400>   25
gttggaggta agaggggccc tgttccagga actgt                              35


<210>   26
<211>   35
<212>   DNA
<213>   Rattus norvegicus

<400>   26
tcctcaggta ggctgggttt ttttccagct gggag                             35


<210>   27
<211>   35
<212>   DNA
<213>   Rattus norvegicus

<400>   27
acagcaggtg aggactttc attgctagac aatac                              35


<210>   28
<211>   35
<212>   DNA
<213>   Rattus norvegicus
```

78

<400> 28
acattcagtt agatatggtc ctctacaggc acacc 35

<210> 29
<211> 35
<212> DNA
<213> Rattus norvegicus

<400> 29
gatgaaggtc agtgggtctc tcctgcagag atcga 35

<210> 30
<211> 7
<212> DNA
<213> Rattus norvegicus

<400> 30
agcatga 7

<210> 31
<211> 90
<212> DNA
<213> Rattus norvegicus

<400> 31
gaaggtcagt gggtggtcct cctccctgac tcattagttt cccatggttc ttgctggtcc 60

ctctgacccc atttctctcc tgcagagatc 90

<210> 32
<211> 29
<212> PRT
<213> Rattus norvegicus

<400> 32

Glu Gly Gln Trp Val Val Leu Leu Pro Asp Ser Leu Val Ser His Gly
1   5   10   15

Ser Cys Trp Ser Leu Pro His Phe Ser Pro Ala Glu Ile
                20   25

<210> 33
<211> 27
<212> PRT
<213> Rattus norvegicus

<400> 33

Gln Trp Val Val Leu Leu Pro Asp Ser Leu Val Ser His Gly Phe Leu

79

```
         1              5                   10                   15

         Leu Val Pro Leu Pro Pro Asn Pro Ser Pro Ala
                         20                   25


         <210>  34
         <211>  3200
         <212>  DNA
         <213>  Rattus norvegicus

         <400>  34
         ggatatagag actctgtacg aggtgcagga actctctggg ggtttgtgtg ccagcttttg      60

         ccggggggtgg catgggggatg aaaaaggaag tgatggaagg gcagggagag agagagagag     120

         agagagagag agagagagag agagagagag agagagagca acagagagtg catacttatg      180

         tgctatatat ctaggggcct ttctctgttc cagtggtggt agcacatgcc tttaatccta     240

         gcattcagga agcagaggca gatgtgtctc taagttctag dacagccaag gctacacaga     300

         caaatcctgt ctctaacctg ttaacttccc caaacaaaac aaaacaaaac agagcaaagc     360

         aaagcaaagc aaaacaaaac aaaacaacat tttcgagtgt tggagcctca cgtctacttc     420

         tgggtgagca tttctctgta tacatcttga atgtgttctt gtgtctaagg ctgtgcgtgt     480

         atgtgtgtct gaattcctgt tcatgtctct atttttgtgt tcatggatgt ccccattgtg     540

         tgtcctaggg cctgagtgtg tttgtgttgg gtgagcccat cacattatat gtttgttaat     600

         cttttggctc ctacttggtg tggagcctag gggttctggt ctggtaatct tccttttttt     660

         tttttttttt tggctttctt ctccaacctg cacagcccct ccttctctca gccgcagcct     720

         tctgcccctc cccttctggg ctgccgcacc ggctgctgcg tctagtcaat atcttatctt     780

         ccgagcagga gctaggagcc attcccagcc gcagcagacc ccaatctaga gtgagagtca     840

         ttgctcagtc cactgtgctc ctgcctgccc gcctttctgc taagcattgg ggtctatttt     900

         ggcccagctt ctgaagaggc tgtgtgtgcc gttggaggta agaggggctc ctgctgcctc     960

         tgacagagct ggggggtgggg gagccctggg aggtagctat gtgaagtgcc tgagccttag    1020

         gcatttctgg ataaattcca tgccttttgt gccccagtgt accttaggat ggtttaggca    1080

         ttttttgtgt ttggctggct gtgagcccct gggtcttggt gggtggacat gtgtgcttgt    1140

         gtagctacgt tgcttctgtg cgggtctata accctaatgt gaggtaacct tgtaggtaaa    1200

         tgtgctccca tgcctctgtg tgtgtcacca tgtgcccacg ggcatgtctg cctttgtctg    1260

         tgtccgtgtg tctgtgtgtg tgcctagtgt ttgtgcatgc tcatggaggc gttcatgtgc    1320
```

80

```
ctgttagtgt agttgtgctg tgttctaagg cctcagtgga cggtgtctag cactgtggtt   1380

acttgtttct gtgccctgtt ccaggaactg tactgagtgg ctttgcaggg tgacagcatg   1440

gagtccctct ttcctgctcc atactgggag gtcttgtatg gcagccactt tcaagggaac   1500

ctgtccctcc taaatgagac cgtaccccac cacctgctcc tcaatgctag tcacagcgcc   1560

ttcctgcccc ttggactcaa ggtcaccatc gtggggctct acttggctgt gtgcatcggg   1620

gggctcctgg ggaactgcct cgtcatgtat gtcatcctca ggtaggctgg gccccatcag   1680

tctgtgaagg gggaacctga ggcaggaggc tgttctgggt gaatctgaac ttccagctgg   1740

gagggcattg aggggggactg gagacagcag gtgaggactt gaatgccaga atggggacat   1800

tgggaagaca tgggaggtcc ttgaatggtg aataactaga gcaaggttct ttttcattgc   1860

tagacaatac tgtgcagttg gaagacacag atctttgatg aactttacag gcagtgccct   1920

gaaaagcctc tgagagaagt cttaagagag actgaggaga gaagacagca tctctctctc   1980

ttgattcatt ccacaaactc acattcaggt tagatatgca ctcaggtact cctccatgcc   2040

cccaactttt ccagggtagt cttgtcattg atttggaacc tttctgtaga tcttctcctt   2100

gtcctctaca ggcacaccaa gatgaagaca gctaccaaca tttacatatt taatctggca   2160

ctggctgata ccctggtctt gctaacactg cccttccagg gcacagacat cctactgggc   2220

ttctggccat ttgggaatgc actctgcaag actgtcattg ctatcgacta ctacaacatg   2280

tttaccagca cttttactct gaccgccatg agcgtagacc gctatgtggc tatctgccac   2340

cctatccgtg cccttgatgt tcggacatcc agcaaagccc aggctgttaa tgtggccata   2400

tgggccctgg cttcagtggt tggtgttcct gttgccatca tgggttcagc acaagtggaa   2460

gatgaaggtc agtgggtggt cctcctccct gactcattag tttcccatgg ttcttgctgg   2520

tccctctgac cccatttctc tcctgcagag atcgagtgcc tggtggagat ccctgcccct   2580

caggactatt ggggccctgt attcgccatc tgcatcttcc ttttttcctt catcatccct   2640

gtgctgatca tctctgtctg ctacagcctc atgattcgac gacttcgtgg tgtccgtctg   2700

ctttcaggct cccgggagaa ggaccgaaac ctgcggcgta tcactcgact ggtgctggta   2760

gtggtggctg tgtttgtggg ctgctggacg cctgtgcagg tgtttgtcct ggttcaagga   2820

ctgggtgttc agccaggtag tgagactgca gttgccatcc tgcgcttctg cacagccctg   2880

ggctatgtca acagttgtct caatcccatt ctctatgctt tcctggatga gaacttcaag   2940

gcctgcttta gaaagttctg ctgtgcttca tccctgcacc gggagatgca ggtttctgat   3000
```

81

cgtgtgcgga gcattgccaa ggatgttggc cttggttgca agacttctga gacagtacca   3060

cggccagcat gactaggcgt ggacctgccc atggtgcctg tcagcccaca gagcccatct   3120

acacccaaca cggagctcac acaggtcact gctctctagg ttgaccctga accttgagca   3180

tctggagcct tgaatggctt   3200

<210> 35
<211> 429
<212> PRT
<213> Rattus norvegicus

<400> 35

Met Glu Ser Leu Phe Pro Ala Pro Tyr Trp Glu Val Leu Tyr Gly Ser
1   5   10   15

His Phe Gln Gly Asn Leu Ser Leu Leu Asn Glu Thr Val Pro His His
                20   25   30

Leu Leu Leu Asn Ala Ser His Ser Ala Phe Leu Pro Leu Gly Leu Lys
            35   40   45

Val Thr Ile Val Gly Leu Tyr Leu Ala Val Cys Ile Gly Gly Leu Leu
        50   55   60

Gly Asn Cys Leu Val Met Tyr Val Ile Leu Ser Glu Gly Ile Glu Gly
65   70   75   80

Asp Trp Arg Gln Gln Thr Ile Leu Cys Ser Trp Lys Thr Gln Ile Phe
                85   90   95

Asp Glu Leu Tyr Arg Gln Cys Pro Glu Lys Pro Leu Arg Glu Val Leu
                100   105   110

Arg Glu Thr Glu Glu Arg Arg Gln His Leu Ser Leu Leu Ile His Ser
            115   120   125

Thr Asn Ser His Ser Gly Thr Pro Arg His Thr Lys Met Lys Thr Ala
        130   135   140

Thr Asn Ile Tyr Ile Phe Asn Leu Ala Leu Ala Asp Thr Leu Val Leu
145   150   155   160

Leu Thr Leu Pro Phe Gln Gly Thr Asp Ile Leu Leu Gly Phe Trp Pro
                165   170   175

Phe Gly Asn Ala Leu Cys Lys Thr Val Ile Ala Ile Asp Tyr Tyr Asn
                180   185   190

Met Phe Thr Ser Thr Phe Thr Leu Thr Ala Met Ser Val Asp Arg Tyr
                195   200   205

82

```
     Val Ala Ile Cys His Pro Ile Arg Ala Leu Asp Val Arg Thr Ser Ser
         210                 215             220

 5   Lys Ala Gln Ala Val Asn Val Ala Ile Trp Ala Leu Ala Ser Val Val
         225             230             235             240

     Gly Val Pro Val Ala Ile Met Gly Ser Ala Gln Val Glu Asp Glu Glu
                     245             250                 255
10
     Ile Glu Cys Leu Val Glu Ile Pro Ala Pro Gln Asp Tyr Trp Gly Pro
                 260             265             270

     Val Phe Ala Ile Cys Ile Phe Leu Phe Ser Phe Ile Ile Pro Val Leu
15       275             280             285

     Ile Ile Ser Val Cys Tyr Ser Leu Met Ile Arg Arg Leu Arg Gly Val
         290             295             300

20   Arg Leu Leu Ser Gly Ser Arg Glu Lys Asp Arg Asn Leu Arg Arg Ile
     305             310             315             320

     Thr Arg Leu Val Leu Val Val Val Ala Val Phe Val Gly Cys Trp Thr
                     325             330             335
25
     Pro Val Gln Val Phe Val Leu Val Gln Gly Leu Gly Val Gln Pro Gly
                 340             345             350

     Ser Glu Thr Ala Val Ala Ile Leu Arg Phe Cys Thr Ala Leu Gly Tyr
30       355             360             365

     Val Asn Ser Cys Leu Asn Pro Ile Leu Tyr Ala Phe Leu Asp Glu Asn
         370             375             380

35   Phe Lys Ala Cys Phe Arg Lys Phe Cys Cys Ala Ser Ser Leu His Arg
     385             390             395             400

     Glu Met Gln Val Ser Asp Arg Val Arg Ser Ile Ala Lys Asp Val Gly
                     405             410             415
40
     Leu Gly Cys Lys Thr Ser Glu Thr Val Pro Arg Pro Ala
             420             425

     <210>   36
45   <211>   15
     <212>   DNA
     <213>   Rattus norvegicus

     <400>   36
50   gtatgtcatc ctcag                                                 15
```
55

83